Vistra's Comments to the ICC's Energy Storage Program Framework RFC

Background:

Public Act 102-0662 states in new Section 16-135 of the Public Utilities Act that the Commission proceeding to address the Energy Storage Program must "develop a framework to identify and measure the potential costs, benefits, that deployment of energy storage could produce, as well as barriers to realizing such benefits …" The ICC issued a request for comments in advance of a January 20 workshop to discuss such framework. The types of benefits envisioned to be discussed include:

- Avoided cost and deferred investments in generation, transmission, and distribution facilities
- Reduced ancillary services costs;
- Reduced transmission and distribution congestion;
- Lower peak power costs and reduced capacity costs;
- Reduced costs for emergency power supplies during outages;
- Reduced curtailment of renewable energy generators;
- Reduced greenhouse gas emissions and other criteria air pollutants;
- Increased grid hosting capacity of renewable energy generators that produce energy on an intermittent basis;
- Increased reliability and resilience of the electric grid;
- Reduced line losses;
- Increased resource diversification; and
- Increased economic development.

In addition to the benefits listed above, the ICC welcomed comments on other benefits and how to measure them or anything else the commentor believes should be considered with respect to the framework.

Vistra's Comments

Vistra believes that dispatchable energy storage will be an essential part of the transition to a clean energy economy in Illinois and other jurisdictions. As a recognized leader in the energy space with a large and growing energy storage portfolio, Vistra is well positioned to provide comments, information and expertise about the development and integration of energy storage into the electricity grid and the benefits energy storage systems provide.[1]

The potential for growth of utility-scale energy storage systems is enormous. A recent Wood Mackenize report[2] projects that by 2030 global installations of energy storage will be close to the 1TWh mark and that lithium-ion battery manufacturing capacity (needed to support large-scale development of battery storage systems) will double in the next two years. The U.S. and China are expected to possess 73 percent of the world's total energy storage capacity in 2030 with 40 percent of the global capacity being in the U.S. In 2030, the U.S. is anticipated to surpass 300GWh of installed capacity and have 53 GWh of

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[1] The "About Vistra" section at the end of this document provides more detailed information about Vistra's activities in the clean energy and energy storage space.

[2] "Global Energy Storage Outlook H2 2021", Woods Mackenzie, 2021: https://www.woodmac.com/reports/power-markets-global-energy-storage-outlook-h2-2021-532298/ (last accessed January 11, 2022 – requires purchase)

installations that year. An increasing global market for energy storage technology, along with government incentives for research & development and implementation, should help reduce costs[3] as well as encourage increased R&D funding.

A primary purpose and benefit (although not the only purpose and benefit) of development and implementation of utility-scale energy storage will be to support the continued growth of intermittent, non-dispatchable renewable resource generation. Vistra believes that, in the long run, utility-scale energy storage systems should be developed and added to the grid through competitive, market-driven processes. However, incentives for storage development may be necessary during the long-term transition to a clean energy electric power sector.

Vistra believes the following principles are key to making a cost effective and efficient transition to a clean energy economy utilizing energy storage:

- Leveraging existing "brownfield" sites (broadly defined to include, for example, former fossil-fueled plant sites, not just sites being remediated in accordance with environmental law requirements), communities eligible for community transition grants, and fossil fueled generation sites with existing transmission, to reduce development costs;
- Providing viable market structures and signals that value both clean energy and reliability attributes;
- Ensuring equal access to energy storage benefits to customers on default service as well as those with alternative retail providers; and
- Ensuring definitions of energy storage include enough flexibility to incorporate future technology and methods of energy storage that may not currently be envisioned.

Vistra strongly believes that, in the long run, competitive market forces provide the best avenue for the cost effective and sustainable deployment of energy storage. However, Vistra also recognizes that today's energy markets were not designed with clean energy as a goal and that transition mechanisms, such as those in Public Act 102-0662, are a necessary step towards achieving a long run sustainable clean energy market. Specifically, current market structures and market dynamics, including capacity pricing, in both PJM and MISO (including both PJM-ComEd and MISO-Zone 4), do not support competitive, market-based development of utility-scale storage. Therefore, government-provided incentives to energy storage development may continue to be needed during a transition period until market forces – principally increased penetration of non-dispatchable resources which require the support of dispatchable storage systems in order that grid reliability be maintained – are sufficient to drive the demand for storage systems to support those resources. Current capacity market structures and pricing in the two RTO regions, as well as the still-relatively nascent penetration of non-dispatchable renewable generation on the bulk power grid, are at present the principal "barriers to realizing such benefits" of energy storage.

[3] Pacific Northwest National Laboratory, "Energy Storage Cost and Performance Database": https://www.pnnl.gov/ESGC-cost-performance (last accessed January 11, 2022)

Benefits of Energy Storage

Battery storage is flexible, can be deployed quickly, has multiple applications, and can produce numerous value streams. Vistra sees a growing market in coupling energy storage with both renewable and traditional generation facilities. The value chain of deploying energy storage in this way extends from the generation facilities, to the grid, to the end use customers. For example, batteries are often supportive of existing generation where daily cycle requires charging on a day-today basis.

Near term, utility-scale energy storage is most likely to replace investment in new peaking plants and enable otherwise non-dispatchable facilities to provide ancillary services, such as non-spinning reserves (instant start). In these cases, storage can help normalize existing markets from distortive effects and at the same time potentially reduce future costs to consumers by delaying the cost of new build.

Furthermore, energy storage does not need to be a "rate base" investment. Vistra and other competitive companies can contract with electric utilities responsible for delivery services to provide reliability services from battery projects. This approach maximizes the value of the batteries because the batteries would provide the delivery utilities with electricity transmission and distribution related reliability services while also being able to provide energy and ancillary services. Utilities could conduct competitive bidding processes for the services they require and then the competitive company would be able to optimize other services from the batteries.

Front of the meter (FTM) services, such as the examples above, are not the only area where energy storage brings value. Behind the meter (BTM) energy storage facilities most directly provide the value of energy storage systems to the retail customer (both residential and non-residential). This value includes better power quality / reliability, pairing with distributed energy generation, microgrids, or demand shaving (helping to reduce demand charges). Vistra believes that growth in energy storage systems at the retail/BTM level will be driven largely by the value perceived by the retail customers to their particular applications.

For example, the addition of onsite energy storage systems can enable better power quality and provide continuity of power or operations during an outage event/storm. Consumers of all sizes and types will be able to more effectively avoid the dangerous and costly outcomes of power outages, including shrinkage (e.g., lost produce or product and materials); building damage and equipment repairs (e.g., pipe leaks/flooding, plastics extruder cleaning, etc.); health issues (e.g., failure of essential equipment or medicine); among others. These costs/consequences affect many more households and businesses in a material way than just the power disruption alone. Additionally, having BTM storage would enable the customer to be able to participate in demand response or other market programs, allowing the customer to access valuable revenue streams or cost reductions while benefiting the broader grid.

Overall, multiple value streams contribute to energy storage economics for both FTM and BTM applications, as enumerated in the table below.

Value Streams			
	Value	**Type**	**Storage Can:**
FTM	Energy Price Arbitrage	Optimization	• Charge when power prices are low / discharge when power prices are high
FTM	Ancillary Services	Optimization	• Provide frequency regulation, load following, reserves, etc.
FTM	Policy Incentives	Financial	• Batteries may qualify for investment tax credit ("ITC"), bonus depreciation, and other incentives / subsidies by state / market / locality
FTM	Black Start	Reliability	• Restart offline thermal power plants
FTM	Voltage Regulation	Quality	• Absorb power to balance reactance in the grid
FTM	Defer Investment in Transmission & Distribution ("T&D")	Reliability	• Install at T&D bottlenecks to avoid the need to invest in additional T&D infrastructure
FTM	Renewable Integration	Optimization, Reliability	• Avoid curtailments of renewables and reshape their output to match supply and demand
FTM	Capacity / Peaker Replacement	Reliability	• Provide system capacity similar to a peaking plant
BTM	Avoid Demand Charge	Financial	• Offset peak demand and lower demand charges
BTM	Pair with BTM Solar	Optimization, Reliability	• Optimize output of BTM solar plants and avoid curtailment
BTM	Power Reliability / Quality	Quality, Reliability	• Allow customers to avoid service interruptions due to grid events

In addition, for as long as the State provides incentives for the development of utility-scale energy storage systems during the transition to fully competitive market structures and processes, it is appropriate for the State to take into account other factors, in addition to the direct benefits (and costs) of adding energy storage to the grid. These factors can include use of "brownfield" sites (broadly defined as above), supporting remediation and (re)development of environmental justice communities, providing employment benefits to former generating plant workers, developing training programs (including partnering with training programs offered by local institutions such as community colleges), and implementing diversity, equity and inclusion programs in connection with the development, construction, and operation of new energy storage facilities; as well the general economic development and fiscal (*e.g.* property taxes) benefits of the energy storage projects to the local communities in which the facilities are located.

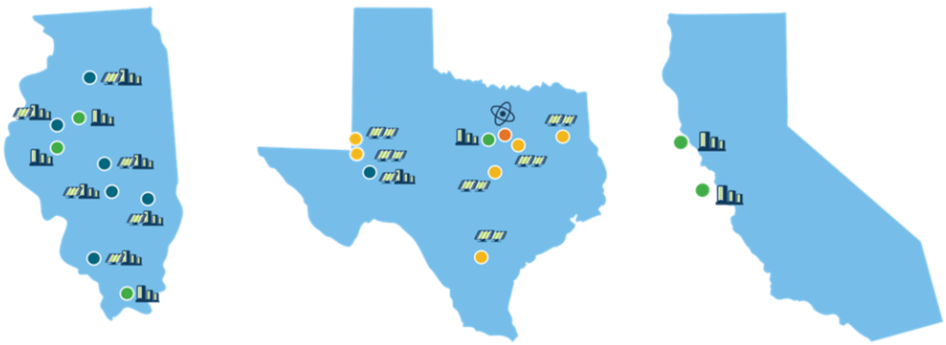
About Vistra

Vistra is a leading Fortune 275 integrated retail electricity and power generation company providing essential resources for customers, commerce, and communities. Vistra brings its products and services to market in 20 states (including Illinois, where Vistra's retail brands (ARES) are the power suppliers to ~660,000 retail customers statewide, making our combined retail brands the largest ARES in the state[4]) and the District of Columbia, including six of the seven competitive wholesale markets in the U.S. and markets in Canada and Japan. Vistra is one of the largest competitive electricity providers in the country (with nearly 4.3 million retail customers) and offers over 50 renewable energy plans. The company is also the largest competitive power generator in the U.S. with approximately 39,000 megawatts of capacity including natural gas, nuclear, solar, and battery energy storage facilities (see table below). In addition, Vistra is a large wholesale purchaser of wind power. The company owns and operates the 400-

[4] "Annual Electric Power Industry Report, Form EIA-861 detailed data files", EIA, 2020 data (https://www.eia.gov/electricity/data/eia861/ - last accessed January 12, 2022)

MW/1,600-MWh battery energy storage system in Moss Landing, California, the largest of its kind in the world.[5]

Vista currently has 2,900 MW of zero-carbon generation online, with another 7,300 MW of zero-carbon generation expected online by 2026. This includes nine projects in Illinois that include energy storage, some paired with solar. Vistra's energy storage projects under development in Illinois will add approximately 150 MW of utility-scale storage capacity in the State by 2026, a substantial increase from the currently in-service battery storage capacity in Illinois of about 132 MW. The graphic below shows Vistra's operating and under-development zero-carbon emission generating facilities and energy storage systems in the U.S.



SOLAR

Andrews Solar Facility
100 MW
Andrews County, TX

Angus Solar Facility
110 MW
Bosque County, TX

Brightside Solar Facility
50 MW
Live Oak County, TX

Emerald Grove Solar Facility
108 MW
Crane County, TX

Forest Grove Solar Facility
200 MW
Henderson County, TX

Oak Hill Solar Facility
200 MW
Rusk County, TX

NUCLEAR

Comanche Peak Nuclear Power Plant
2,300 MW
Somervell County, TX

ENERGY STORAGE

DeCordova Energy Storage Facility
260 MW
Hood County, TX

Edwards Energy Storage Facility
37 MW
Peoria County, IL

Havana Energy Storage Facility
37 MW
Mason County, IL

Joppa Energy Storage Facility
37 MW
Massac County, IL

Moss Landing Energy Storage Facility
400 MW/1,600 MWh
Moss Landing, CA

Oakland Energy Storage Facility
36.25 MW/ 145 MWh
Oakland, CA

SOLAR + ENERGY STORAGE

Baldwin Solar & Energy Storage Facility
68 MW solar; 9 MW battery
Randolph County, IL

Coffeen Solar & Energy Storage Facility
44 MW solar; 6 MW battery
Montgomery County, IL

Duck Creek Solar & Energy Storage Facility
20 MW solar; 3 MW battery
Fulton County, IL

Hennepin Solar & Energy Storage Facility
50 MW solar; 6 MW battery
Putnam County, IL

Kincaid Solar & Energy Storage Facility
60 MW solar; 8 MW battery
Christian County, IL

Newton Solar & Energy Storage Facility
52 MW solar; 7 MW battery
Jasper County, IL

Upton 2 Solar & Energy Storage Facility
180 MW solar; 10 MW/42 MWh battery
Upton County, TX

List includes publicly announced projects under development

[5] Vistra's sustainability report is available at https://www.vistracorp.com/sustainability/

Conclusion

Vistra appreciates the ICC's consideration of these comments and looks forward to using our experience and expertise in energy storage systems to contribute to the Energy Storage Program Framework.

Respectfully Submitted by:

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